Pulmonary Drug Delivery Across Alveolar Epithelium

Overview

Mechanisms for protein transport
Mechanisms for peptide transport
Enhancement of peptide/protein absorption via transferrin receptor-mediated transcytosis
Regulation of peptide/protein absorption by physicochemical and soluble factors

Partnership

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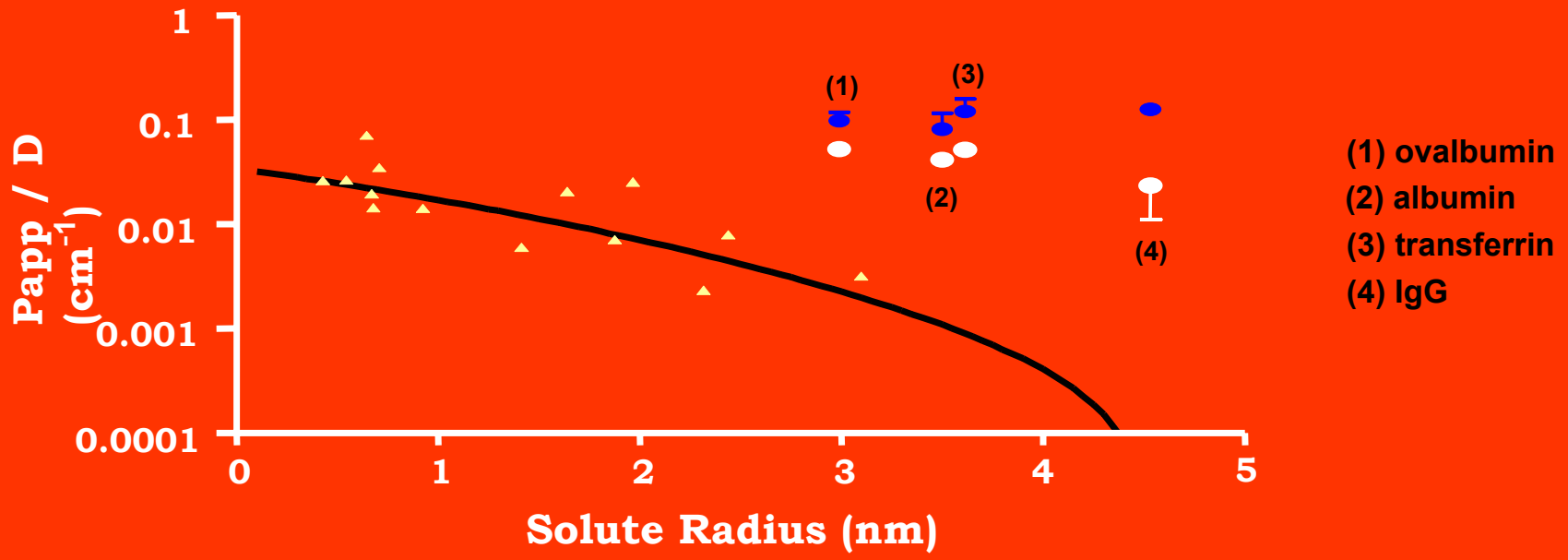
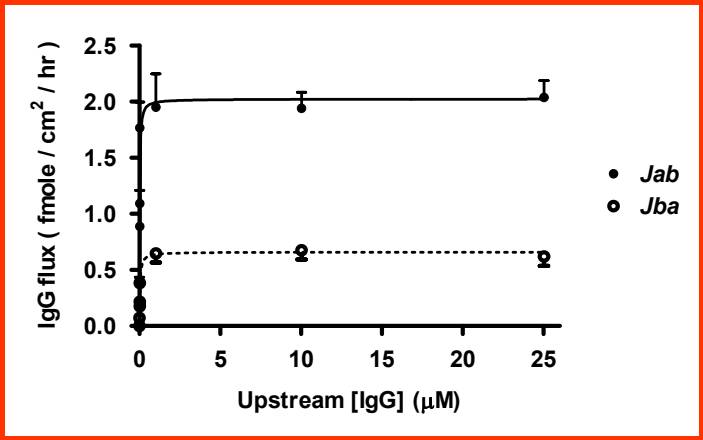
SPECIALIZED TRANSPORT OF MACROMOLECULES ACROSS ALVEOLAR EPITHELIUM

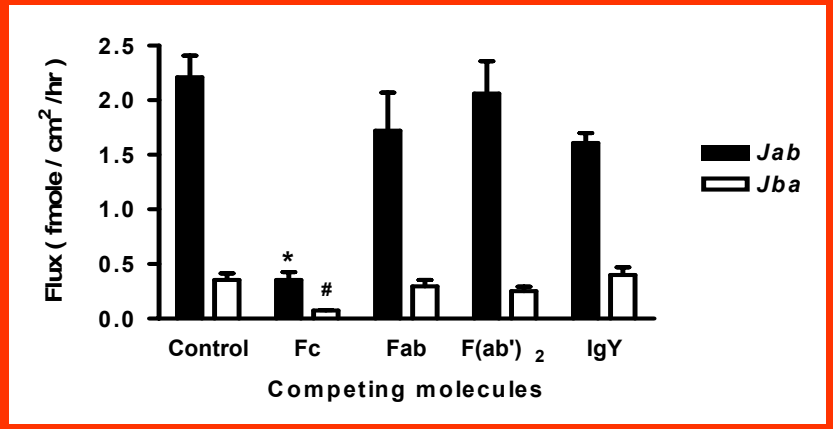


Papp/D vs molecular radius of various solutes, where D is free diffusion coefficient of the molecule. Yellow triangles depict transport rates observed for various hydrophilic solutes (Matsukawa et al., 1997), while the black line represents an equivalent pore radius of 6 nm. Blue circles denote ab flux. White circles denote ba flux.

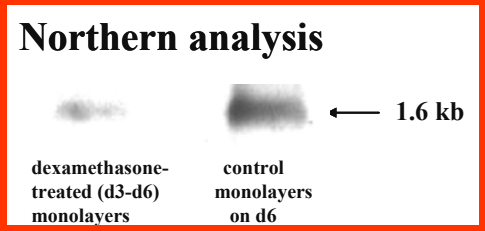
IgG absorption mechanisms across alveolar epithelium



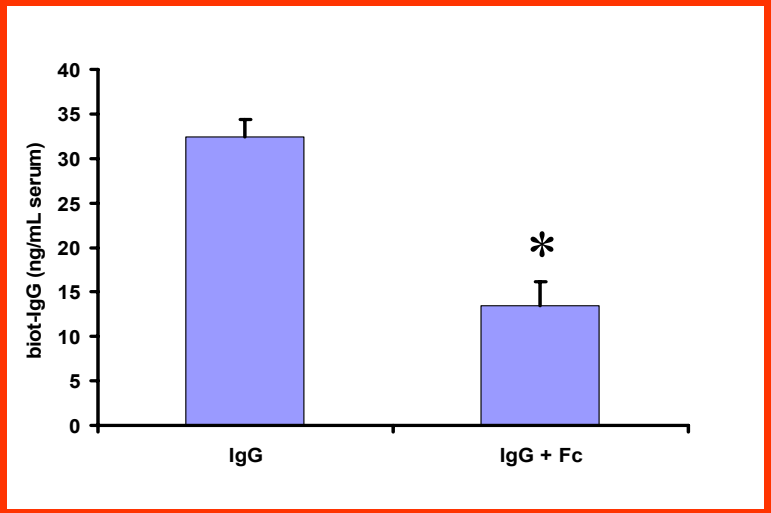
Unidirectional fluxes of biot-rIgG across RAECM vs upstream [rIgG].



Effects of excess unlabeled macromolecules on biot-rIgG fluxes across RAECM. Upstream [biot-rIgG] was 25 nM. Unlabeled macromolecules were present at 100x molar excess (i.e., 2500 nM).

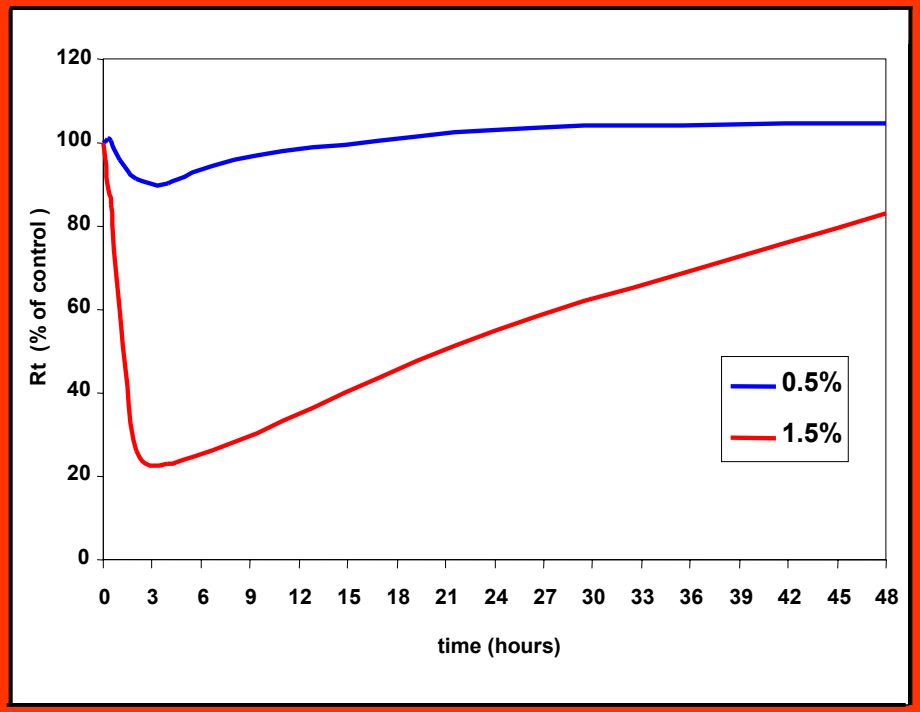


Northern analysis of total RNA from RAECM for rat FcRn.

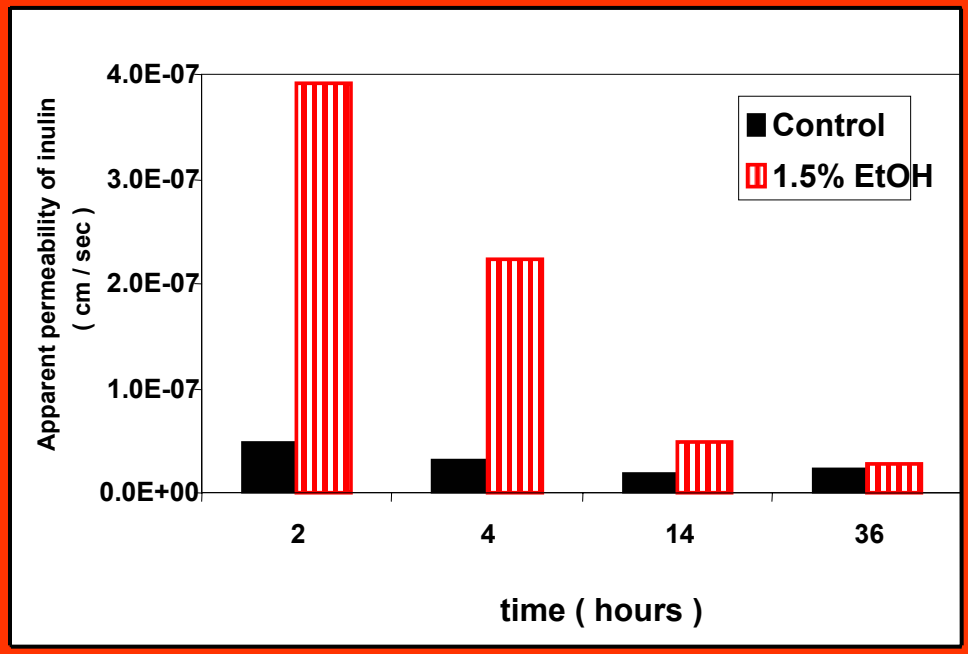


In vivo pulmonary IgG absorption into serum at 18hr. Rats were administered (by intratracheal microspray instillation) 20 μg biotin-IgG or 20 μg biotin-IgG plus 220 μg rat Fc.

Effects of ethyl alcohol on drug absorption across alveolar epithelium



Effects of apical ethyl alcohol on electrical resistance of RAECM.



Effects of ethyl alcohol on apparent permeability of inulin (ab) across RAECM. Vehicle (culture medium) or EtOH was added to apical fluid five minutes after instillation of ^{14}C-inulin into apical fluid.